**Use Case: Smart Vending Machine**

**Actors:**

1. **Customer** – Purchases items from the vending machine.
2. **Restocker** – Refills vending machines and removes expired/recalled items.
3. **Marketing Specialist** – Analyzes sales data and makes stocking recommendations.
4. **System Administrator** – Maintains and updates the software.
5. **Vending Machine System** – Automated system handling transactions and inventory.

**Description:**

This use case describes the interaction between different actors and the Smart Vending Machine system. Customers purchase items using a touchscreen interface, restockers receive restocking instructions via a mobile interface, and corporate users monitor inventory and sales trends via the management interface.

**Stakeholders and Interests:**

* **Vending Machine Company** – Wants to optimize operations and reduce errors.
* **Customers** – Expect an easy and quick purchase experience.
* **Restockers** – Want clear instructions to simplify their job.
* **Marketing Team** – Needs sales data for informed decision-making.
* **System Administrators** – Need to ensure software reliability and security.

**Pre-conditions:**

1. The vending machine must be powered on and connected to the network.
2. Items must be stocked in the vending machine.
3. The customer must have cash or an accepted payment method.
4. Restockers must have access to their mobile interface.
5. The management system should have access to the vending machine’s real-time data.

**Post-conditions:**

1. The customer receives the purchased item.
2. The vending machine updates its inventory in real-time.
3. The management system logs the transaction.
4. Restockers receive updated restocking instructions as inventory changes.

**Normal Flow:**

1. The customer selects an item using the touchscreen.
2. The system displays the price and requests payment.
3. The customer inserts cash.
4. The system verifies the payment and dispenses the item.
5. The system updates inventory and logs the transaction.
6. The management system updates sales records.

**Alternative Flow:**

* **Payment Failure:** If the customer does not insert enough money, the system prompts them to add more.
* **Item Unavailable:** If the selected item is out of stock, the system notifies the customer.
* **Change Not Available:** If the machine cannot return exact change, it prompts the customer to use exact cash or select another item.
* **Restocking Mode:** When a restocker accesses the machine, it temporarily locks customer access until restocking is complete.

**Exceptions:**

* **Network Failure:** The vending machine operates in offline mode but does not update real-time inventory.
* **Item Jammed:** The system notifies the management tool and displays an error message to the customer.
* **Hardware Malfunction:** The machine shuts down and alerts the system administrator.

**Priority:**

* **High Priority:** Core vending machine operations (customer purchases, real-time inventory updates, and restocking instructions).
* **Medium Priority:** Advanced analytics and reporting.
* **Low Priority:** Future enhancements like personalization and digital payment methods.

This use case ensures a seamless operation for customers, restockers, and corporate management while minimizing errors and optimizing vending machine efficiency.